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EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 09/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/987,932

Applicant(s)

KIRKBRIDE ET AL.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12-6-05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on February 9, 2006 has been received and carefully considered. The changes made to the specification and drawings are acceptable. Claims 1-22 are cancelled. Claims 23-54 are under consideration.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 34, 35, 38, 40, 46, 47, 51 and 53 are rejected under 35 U.S.C. 102(b) as being anticipated by Weil et al. (US 3,891,403).

Regarding claims 34 and 53, Weil et al. (FIG. 1-3; generally, column 3, line 68 to column 9, line 14) discloses a reactor system comprising a fluidized bed reactor (i.e., hydrogasifier 10, having “a series of fluidized beds which are heated by the upwardly moving or countercurrent flowing hydrogen rich gas,” column 4, lines 2-25); said reactor 10 having a feed inlet for a fluidizable feed comprising an oil shale comprising kerogen (i.e., via line “OIL SHALE”); a fluidizing medium inlet for a gas comprising hydrogen (i.e., via line “H₂”); an outlet for a reactor product gas comprising a hydrocarbon (i.e., via line “VAPORIZED LIQUIDS”); and an outlet for solid (i.e., via line “SPENT SHALE”). The fluidized bed in reactor 10 is free of a contained catalyst bed and substantially comprises the fluidized feed (i.e., the oil shale as fluidized by the upwardly moving hydrogen rich gas). The recited operating temperature of the reactor 10

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provides no further patentable weight to the claim because the operating temperature is not an element of the apparatus but a process limitation. In any event, Weil et al. discloses an operating temperature in a range of about 50 to about 1500 °F (i.e., between about 300 and 1500 °F; column 4, lines 26-55). In addition, the newly added limitation relating to the composition of the product stream (i.e., a particular vol % of CO) imparts no further patentable weight to the claim because expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim, *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969), and the inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims, *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963).

Regarding claims 35 and 38, Weil et al. discloses, “The oil shale which is introduced to the reactor 10 has been previously subjected, in a conventional manner, to an oil shale crusher (not shown) for reducing the mined oil shale to the size of pebbles having a diameter in the range of about 1/4 - 1 inches.” (column 4, lines 13-19).

Regarding claim 40, Weil et al. discloses a hydrogen recycling system positioned downstream for the gas outlet (i.e., comprising “METHANE-HYDROGEN SEPARATION” apparatus; see FIG. 2, 3).

Regarding claim 46, Weil et al. discloses a gas-liquid separator (i.e., comprising “LIQUID GAS SEPARATION” apparatus in FIG. 2, column 6, lines 43-49; also shown as “H₂O-GAS-LIQUID SEPARATION” apparatus in FIG. 3).

Regarding claim 47, Weil et al. discloses a scrubbing system (i.e., monoethanolamine scrubbing system; FIG.3; column 8, lines 54-60).

Regarding claim 51, the oil shale inherently comprises pieces capable of passing through a one inch mesh, because “The oil shale which is introduced to the reactor **10** has been previously subjected, in a conventional manner, to an oil shale crusher (not shown) for reducing the mined oil shale to the size of pebbles having a diameter in the range of about 1/4 - 1 inches.” (column 4, lines 13-19). Also, the reactor system recycles hydrogen (i.e., via “METHANE-HYDROGEN SEPARATION” apparatus; FIG. 2, 3) and comprises a gas purge (i.e., CH₄, leaving as “PIPELINE GAS”; FIG. 1-3). The recited operating temperature and pressure of reactor **10** and the recited temperature of hydrogen fed provide no further patentable weight to the claim because temperature and pressure are process limitations. In any event, Weil et al. discloses an operating temperature of about 1000 °F or lower (see column 4, lines 26-55), an operating pressure of 450 psi or greater (see column 5, lines 12-20), and a hydrogen temperature inherently about 1500 °F or lower (see column 4, lines 48-55).

Instant claims 34, 35, 38, 40, 46, 47, 51 and 53 structurally read on the apparatus of Weil et al.

3. Claims 34, 35, 38, 40, 41, 43, 45-47 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Schora et al. (US 4,560,547).

Regarding claim 34, Schora et al. (FIG. 1; column 4, line 56 to column 6, line 46) discloses a reactor system comprising a fluidized bed reactor (i.e., fluidized bed reactor **10**) having a feed inlet for a fluidizable feed comprising an oil shale comprising kerogen (i.e., raw oil shale fines via lock-hopper **21**); a fluidizing medium inlet for a gas comprising hydrogen (i.e., via conduit **24**); an outlet for a reactor product gas comprising a hydrocarbon (i.e., via conduit **18**); and an outlet for solid (i.e., via conduit **17**). The fluidized bed **11** is free of a contained

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catalyst bed and substantially comprises the fluidized feed (i.e., oil shale fines fluidized by hydrogen and other gases). The recited operating temperature provides no further patentable weight to the claim because the operating temperatures and pressure are not an element of the apparatus but a process limitation. In any event, Schora et al. discloses said reactor **10** having an operating temperature in a range of about 50 to about 1500 °F (column 5, lines 41-43). In addition, the newly recited limitations relating to the composition of the product stream (i.e., having a particular vol % of CO) imparts no further patentable weight to the claim because expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Also, the inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963).

Regarding claims 35 and 38, the feed comprises pieces having a dimension of 1 inch or less (i.e., an average diameter of less than about 0.125 inch; column 4, lines 51-55).

Regarding claim 40, Schora et al. discloses a hydrogen recycling system (i.e., comprising recycle conduits **24** and **49**; FIG. 1).

Regarding claim 41, Schora et al. discloses a separator (i.e., solids separator **40**; FIG. 1).

Regarding claim 43, the feed inlet (i.e., via hopper **21**, conveying line **23**) and fluidizing medium inlet (i.e., via conduit **24**) are positioned for co-current flow (see FIG. 1).

Regarding claims 45 and 46, Schora et al. discloses a heat exchanger (i.e., waste heat boiler **42**) and a gas-liquid separator (i.e., cooler-condenser **44**).

Regarding claim 47, Schora et al. discloses a scrubbing system (i.e., purification means

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51, wherein “raw product gas may first be treated in an acid gas removable plant where it is scrubbed...” column 6, lines 36-46).

Regarding claim 51, the feed inherently comprises pieces capable of passing through a one inch mesh (i.e., the feed has an average diameter of less than about 0.125 inch; column 4, lines 51-55). Also, the reactor system is adapted to recycle hydrogen (i.e., via conduits 24, 49) and comprises a gas purge (i.e., via lines 34, 52). The recited operating temperature and pressure of the reactor 10 and the recited temperature of the hydrogen provide no further patentable weight to the claim because the operating temperatures and pressure are not elements of the apparatus but process limitations. The apparatus of Schora thus structurally meets the claim.

Instant claims 34, 35, 38, 40, 41, 43, 45-47 and 51 structurally read on the apparatus of Schora et al.

4. Claims 23, 24, 29-31, 34, 35, 38-40, 45-47 and 50-54 are rejected under 35U.S.C. 102(b) as being anticipated by Tassoney et al. (US 3,715,301).

Regarding claims 23 and 34, Tassoney et al. (FIG. 1; column 8, line 31 to column 10, line 41) discloses a reactor system comprising a fluidized bed reactor (i.e., fluidized bed retort 17) having a feed inlet (i.e., via line 16), a fluidizing medium inlet (i.e., via line 18), an outlet for a reactor product gas (i.e., via line 19) and an outlet for solid (i.e., via line 38); wherein the fluidized bed within the reactor 17 is free of a contained catalyst bed (i.e., the process is noncatalytic; column 3, lines 21-24) and comprises substantially the fluidized feed, said feed including solid carbonaceous fuels of oil shale (which inherently comprises kerogen) and tar sands (which inherently comprises bitumen). (see column 2, lines 10-21; column 3, lines 25-33). Please note that the recited operating temperature provides no further patentable weight to the

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claims, because the operating temperature is not considered an element of the apparatus but a process limitation. In any event, Tassoney et al. discloses said reactor 17 having an operating temperature in a range of about 50 to about 1500 °F (column 2, lines 38-46). In addition, the newly recited limitations relating to the composition of the product stream (i.e., having a particular vol % of CO) imparts no further patentable weight to the claim because expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Also, the inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963).

Regarding claims 24 and 40, Tassoney et al. discloses a hydrogen recycling system (i.e., via lines 29, 33; column 9, lines 34-39).

Regarding claims 29 and 45, Tassoney et al. discloses a heat exchanger (i.e., heat exchanger 20; column 9, lines 9-22).

Regarding claims 30 and 46, Tassoney et al. discloses a gas-liquid separator (i.e., gas-liquid separator 24; column 9, lines 9-22).

Regarding claims 31 and 47, Tassoney et al. discloses a scrubbing system (i.e., "... particulate carbon are removed from the gas stream by scrubbing with water and leave the gas purification zone by way of line 63," column 10, lines 25-41; column 6, lines 12-59).

Regarding claims 35 and 38, Tassoney et al. discloses a feed introducing system comprising a conventional grinder 2 for producing feed comprising fluidizable pieces of about 1/4 to 1/2 inch diameter (column 8, lines 41-53).

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Regarding claims 39 and 54, Tassoney et al. discloses the feed introducing system (i.e., raw coal line 1, grinder 2, line 3, mixer 4, line 7 and pump 6; FIG. 1) maintains the feed at a temperature of about 100 °F or lower (i.e., “At *ambient temperature* by means of pump 6, the slurry is pumped through lines 7 and 8, nozzle mixer 9 and line 10,” column 8, lines 49-58).

Regarding claims 50 and 51, Tassoney et al. discloses feed pieces that are inherently capable of passing through a one inch mesh (i.e., 1/4 to 1/2 inch average diameter pieces; column 8, lines 41-53). Also, the reactor system is adapted to recycle hydrogen (i.e., via lines 29, 33) and comprises a gas purge (i.e., via line 65). Please note that the recited operating temperature and pressure of the reactor 17 and the recited temperature of the hydrogen 18 provides no further patentable weight to the claims because temperatures and pressures are not considered elements of an apparatus but process limitations. The apparatus of Tassoney et al. thus meets the claims.

Regarding claims 52 and 53, Tassoney et al. discloses the feed inlet (i.e., via line 16) and the fluidizing medium inlet (i.e., via line 18) being positioned for countercurrent flow (FIG. 1).

Instant claims 23, 24, 29-31, 34, 35, 38-40, 45-47 and 50-54 structurally read on the apparatus of Tassoney et al.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 25, 26, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Stratford (US 3,118,746).

Tassoney et al. is silent as to the reactor system comprising a cyclone separator for removing entrained solids from the reactor product gas in line 19. In any event, it would have

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been obvious for one of ordinary skill in the art at the time the invention was made to provide a cyclone separator to the reactor system of Tassoney et al., on the basis of suitability for the intended use, because the provision of cyclone separators at the gas outlet of fluidized bed reactors for the removal of entrained solids is well known in the art, as evidenced by Stratford. In particular, Stratford (FIG. 1; column 2, lines 40-73) teaches a similar reactor system for producing synthetic fuel, wherein the reactor system comprises a fluidized bed reactor (i.e., conversion zone 2) having an outlet for reactor product gas (i.e., via line 3), and a cyclone separator 4 for removing entrained solids, such as powdered shale or ash, from the reactor product gas 3.

6. Claims 27 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Kalbach (US 2,639,982).

Tassoney et al. is silent as to whether the feed inlet 16 and fluidizing medium inlet 18 may be positioned for co-current flow (i.e., the flow is counter-current, see figure). In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the feed inlet 16 and the fluidizing medium inlet 18 for co-current flow in the apparatus of Tassoney et al., on the basis of suitability for the intended use, because the shifting of location of parts merely involves routine skill in the art, and the use of fluidized bed reactors having a co-current flow configuration are conventionally known in the art, as evidenced by Kalbach. In particular, Kalbach (FIG.) teaches a reactor system for producing synthetic fuel from carbonaceous solids, wherein the reactor system comprises a fluidized bed reactor (i.e., hydrogenation reactor 1) having a feed inlet (i.e., via line 18) and a fluidizing medium inlet (i.e., via line 19) positioned for co-current flow (See FIG.).

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7. Claims 28, 32, 33, 44, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Schlinger et al. (US 3,224,954).

Tassoney (Figure) discloses the hydrogen recycling system comprising a separating device (i.e., separator **24**) for removing a portion of the hydrocarbon from the product gas (i.e., removing hydrocarbon **25** from the product gas **23**), thereby producing a gas comprising a recycle hydrogen fed to a recycle hydrogen gas stream (i.e., hydrogen recycle in stream **29** to **33**); wherein a compressor **34** pressurizes the recycle hydrogen in stream **33**. Make-up hydrogen is further generated in a synthesis gas generator **30** by partial oxidation. Tassoney, however, is silent as to the instantly recited configuration for the hydrogen recycling system. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute other known, suitable, hydrogen recycling systems for the hydrogen recycling system in the apparatus of Tassoney et al., on the basis of suitability for the intended use, because the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). For instance, Schlinger (FIG. 1; column 5, lines 28-36) teaches a conventionally known hydrogen recycling system having the instantly recited configuration, wherein the hydrogen recycling system is incorporated into an apparatus for producing synthetic fuel from oil shale and the like, the hydrogen recycling system comprising a separating device (i.e., gas and liquid separator **8**) for removing a portion of hydrocarbon from the reactor product gas (i.e., a hydrocarbon liquid product **12** being removed from a product gas **6**), thereby producing a gas comprising a recycle hydrogen fed to a recycle hydrogen gas stream (i.e., recycle line **9**); a make-up hydrogen feed stream (i.e., via line **11**); a

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mixing device for admixing recycle hydrogen **9** and make-up hydrogen **11** (i.e., at the mixing “T” defined by the intersection of lines **9** and **11**); a compressor having a recycle hydrogen feed and a make-up hydrogen feed (i.e., compressor **10**, which compresses hydrogen from lines **9** and **11**); and a heater **2** receiving the hydrogen mixture stream from compressor **10**.

8. Claims 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tassoney et al. (US 3,715,301) in view of Graf (US 3,915,395).

Tassoney et al. discloses that the feed introducing system comprises a conventional grinder **2**, for reducing the size of the feed to about a 1/4 to 1/2 inch average diameter (column 8, lines 48-51). Although Tassoney et al. does not specifically describe the apparatus comprising a screening device, some sort of screening device will be inherently present in the conventional grinders of the art, to enable to production of feed particles of the desired size. Such a screening device is evidenced by Graf. In particular, Graf teaches a conventional grinder (i.e., crusher machine **23**) for reducing the size of material such as coal, lignite, ore, stone, rock, oil shale and the like, wherein the grinder **23** comprises a screening device (i.e., apertured particle sizing means, which may be a grate **50**, including a screen, or other means having openings to pass smaller particles and reject larger particles provided in or in communication with rotor housing **23**; column 3, lines 50-55). It would have been further obvious for one of ordinary skill in the art at the time the invention was made to configure such a screening device to remove pieces of feed having a dimension greater than about 1 inch, in order to maintain the feed pieces within the desired range of 1/4 to 1/2 inch average diameter, because changes in size merely involves routine skill in the art, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Response to Arguments

9. Applicant's arguments filed February 9, 2006 have been fully considered but they are not persuasive. On page 18 of the response (beginning at line 5), Applicants argue,

“... Amended claims 23 and 34 recite “said reactor having an outlet of a continuous stream of an off gas comprising 0.30 vol% or less CO”. Applicants respectfully assert none of the documents cited in the office action disclose this claimed element of Applicants’ invention.”

The Examiner respectfully disagrees. Please note that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963). A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

* * *

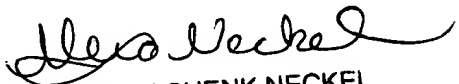
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer A. Leung

September 8, 2006 *JAL*


ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER